which we hope to give, hereafter. There are many parts, which exhibit considerable novelty and ingenuity, and the whole is comprised in a very compact form. The power of the engine, which stands upon a base of about four feet square, is said to be capable of variation, from fifteen, to thirty horses, according to circumstances, connected with the economization of fuel. It has not yet been exhibited in operation, but that is expected to take place in a few days.

At present, we beg to be understood, as merely reporting progress, and not in any respect as venturing an opinion as to the result: we have only seen the engine for a few minutes, in a state of inertia; by the time of publishing our next number, we, probably, shall be in a situation to say something that may be satisfactory, if not final.

[*Lond. Journ. of Arts & Sciences.*

Perkins's high-pressure Engines.

A report has been made by M. Girard, on a memoir by Sir Wm. Rawson, on Perkins's high-pressure engines, read to the Academy of Sciences at Paris. The report, after enumerating the advantages, stated in the memoir to be possessed by the apparatus, observes, how desirable it would be, that these assertions should be supported by authentic experiments, which, it appears to them, they want at present, unless it be in the propulsion of balls, which comprises the whole of the official proofs.

[*Bull Univ. p. 257.*

On the preparation of Hydraulic Cements. By General TREUSSART.

GENERAL TREUSSART, referring to some observations, published at St. Petersburg, in 1822, by M. Raucourt, and to some experiments of his own, related, in a late number of the *Memorial de l'officier de Génie*, states, that he has, since then, established an important fact, which he had previously been led, by Raucourt's remarks, to anticipate, with regard to the preparation of artificial pozzolan-mortar, or hydraulic cement; namely, that the access of air, during the calcination of the argillaceous cement, is of great consequence to the tenacity of the mortar, and the quickness with which it hardens. He first refers to his former experiments, (which we have not yet seen,) as proving, that, contrary to what is generally supposed, neither the oxide of iron, nor that of manganese, nor magnesia, can communicate to lime, the property of hardening under water. He then observes, that, on calcining an argillaceous earth, procured near Frankfort, (and consisting of silica and alumina, a 66th part of magnesia, and a trace of iron,) and mixing it with half its weight of lime, to form a mortar, he found, that, if it had been calcined under free exposure to the air, it hardened under water, in two or three days; and, at the end of a year, required a weight varying from 390 to 530 pounds to break it; while, if the clay had been calcined out of reach of the air, the mortar took thirty days to harden, and broke with a weight of 40 or 50 pounds. Analogous results were obtained with a clay from

Holzheim, near Strasburg; and in this instance, he also found that it was useful to mix a fiftieth part of lime with it, before calcination. It is not easy to account for these differences; but the general himself, is disposed to ascribe them to the absorption of oxygen, by the alumina. In proof of this, he mentions, that the same difference is observed, if, instead of impure clay and lime, the purest alumina, and the lime of white marble, be employed. The alumina, when calcined under a current of air, makes a mortar which hardens sooner, and is much stronger, than when the calcination is conducted in a close furnace. Another fact in support of his conjecture, is, that alumina, when calcined in the air, dissolves more easily in sulphuric acid. The results of his latest investigations, are, that the clay to be chosen for the best hydraulic mortars, should contain a little lime; that it should be calcined under exposure to a current of air, contrived according to the nature of the furnace; that, after being reduced to a fine powder, it should be mixed with paste of lime, in the proportion of one of the latter, to two, or two and a half, of the former: that the mortar should be kept for ten or twelve hours before it is used, in order to acquire a certain degree of consistence; and that it may be perfectly relied on, if, by a preliminary trial, it is found to harden in three or four days; his experience having invariably shown, that the mortars which harden soonest, are also the most tenacious.—*Annales de Chimie et de Physique, Mars, 1826.*

Composition for the Covering of Buildings, by M. Pew.

THE composition proposed by the author, is destined to form a sort of unalterable, and incombustible mastic. For this purpose, he takes the hardest, and the purest limestone that he can find, free from sand, clay, or other heterogeneous matter. White marble is to be preferred, if it can be procured. The limestone is calcined in a reverberatory furnace; it is then pulverized, and passed through a sieve. One part is taken by weight, and mixed with two parts of clay, well baked, and similarly pulverized. This mixture must be made with great care. On the other hand, one part of calcined and pulverized sulphate of lime (gypsum,) is taken, and two parts of clay, baked, and pulverized, added to it. These two sorts of powder are then combined and incorporated, so as to produce a perfect mixture. The composition is preserved for use in a dry place, sheltered from the air, where it keeps for a long time, without losing its properties. When it is to be used, it is mixed with about a fourth part of its weight of water, which is gradually added, stirring it continually, until it forms a thick paste. This paste is spread upon the laths, and joists of buildings, which it renders entirely incombustible. It becomes, in time, as hard as stone; allows no moisture to penetrate, and is not cracked by heat. When well prepared, it will last for any length of time. The composition, when still in a plastic state, will receive whatever colour it may be thought proper to give it.